



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,390	10/20/2003	Mark Beaumont	DB001063-000	4149
57694	7550	08/24/2010	EXAMINER	
JONES DAY 222 East 41st Street New York, NY 10017-6702			PETRANEK, JACOB ANDREW	
			ART UNIT	PAPER NUMBER
			2183	
			MAIL DATE	DELIVERY MODE
			08/24/2010	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/689,390

**Applicant(s)**

BEAUMONT, MARK

**Examiner**

JACOB PETRANEK

**Art Unit**

2183

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 August 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15, 22-29 and 36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-15 and 22-29 is/are allowed.
- 6) ☒ Claim(s) 1-7, 36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-06)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. Claims 1-15, 22-29, and 36 are pending.
2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/11/2010 has been entered.
3. The office acknowledges the following papers:  
Claims and arguments filed on 8/11/2010.

***Allowable Subject Matter***

4. Claims 8-15 and 22-29 are allowed.

***New Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:  

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
6. Claims 1-6 and 36 are rejected under 35 U.S.C. §103(a) as being unpatentable over Crozier (U.S. 5,081,700), in view of Pechanek et al. (U.S. 6,338,129).
7. As per claim 1:

Crozier disclosed a method of rotating data in a plurality of processing elements, comprising:

a plurality of shifting operations performed by a plurality of rows or columns (Crozier: Figures 5a-d, column 5 lines 39-58)(Figure 5 shows a plurality of shift operations between figures 5b-d amongst the individual rows and columns being shifted different amounts. The plurality of shifts are performed on a plurality of rows or columns.), each shifting operation being performed such that each processing element in each row or column receives the data originally held by every other processing element in that row or column, respectively (Crozier: Figures 5a-d, column 5 lines 39-58)(Figure 5 shows a plurality of shift operations between figures 5b-d amongst the individual rows and columns being shifted different amounts. Each figure shows a single shifting operation that is shifted in such a way that each location receives every data held in every position of the row/column. Thus, there is a plurality of shifting operations (i.e. three, one from each figure) that receive data from every location within the row/column.);

a plurality of selecting operations on said received data, where each of the received data is a candidate for selection (Crozier: Figures 5a-d, column 5 lines 39-58)(After each shifting operation in figures 5a-c, data is selected to be stored prior to the next shifting operation in a different direction. Any received data can be possibly selected based on the number of required shifts in a given direction.), said shifting and selecting operations coordinated to enable a three shears operation to be performed on the data (Crozier: Figures 5a-d, column 5 lines 39-58)(A three shears operation involves

three separate shifts on data. The method of rotating data in figure 5 involves 3 separate shifts. Figure 5b involves a down shift, figure 5c involves a left shift, and figure 5d involves an up shift. The shifting results in a 90-degree rotation of the data.).

Crozier failed to teach shifting and selecting operations are performed by a plurality of processing elements connected in an array.

However, Pechanek disclosed shifting and selecting operations are performed by a plurality of processing elements connected in an array (Pechanek: Figure 1a, column 1 lines 46-67 continued to column 2 lines 1-28)(The shifting and storing operations done by Crozier in combination with Pechanek result in operations being done in processing elements.).

Image processing is an example of an application that can be done efficiently on a parallel processor (Pechanek: Column 1 lines 13-20). One of ordinary skill in the art would have been motivated to find such image processing applications that work on the parallel processing unit Pechanek uses to find Crozier's method of image rotation. Thus, it would have been obvious to one of ordinary skill in the art to implement Crozier's method of image rotation on the parallel processor of Pechanek for the advantage of being able to efficiently process the images.

8. As per claim 2:

Crozier and Pechanek disclosed the method of claim 1 wherein said plurality of selecting operations are responsive to initial counts (Crozier: Figure 2 elements 37 and 48, column 3 lines 24-31 and column 4 lines 12-22)(Crozier disclosed maintaining counters for the shifting being done to perform the 90-degree rotation. It's inherent that

there is an initial count determined to know how many shift operations will be done.).

Crozier and Pechanek failed to teach where one of said initial counts which are either loaded into at least one of said processing elements or calculated locally based on the processing element's location.

However, one of ordinary skill in the art would recognize that the shifting counters placement doesn't have an effect on the process of shifting the data and could be placed anywhere. Thus, it would have been obvious to one of ordinary skill in the art to implement shift counters within the processing elements to determine how many shift operations are left. In addition, according to "In re Japikse" (181 F.2d 1019, 86 USPQ 70 (CCPA 1950)), shifting the location of parts doesn't give patentability over prior art.

9. As per claim 3:

Crozier and Pechanek disclosed the method of claim 2 additionally comprising maintaining a current count in each processing element for each initial count, said current counts being responsive to said initial counts and the number of data shifts performed (Crozier: Figure 2 elements 37 and 48, column 3 lines 24-31 and column 4 lines 12-22)(It would have been obvious to one of ordinary skill in the art at the time of the invention that the counters could have been initially set and decremented until the data arrived in the correct place to perform the 90-degree rotation as shown in figures 5b-d.).

10. As per claim 4:

Crozier and Pechanek disclosed the method of claim 3 wherein said maintaining current counts includes altering said initial counts at programmable intervals by a

Art Unit: 2183

programmable amount (Crozier: Figure 2 elements 37 and 48, column 3 lines 24-31 and column 4 lines 12-22)(It would have been obvious to one of ordinary skill in the art at the time of the invention that the counters could have been initially set and decremented until the data arrived in the correct place to perform the 90-degree rotation as shown in figures 5b-d.).

11. As per claim 5:

Crozier and Pechanek disclosed the method of claim 4 wherein said initial counts are decremented in response to a shifting of data to produce said current counts (Crozier: Figure 2 elements 37 and 48, column 3 lines 24-31 and column 4 lines 12-22)(It would have been obvious to one of ordinary skill in the art at the time of the invention that the counters could have been initially set and decremented until the data arrived in the correct place to perform the 90-degree rotation as shown in figures 5b-d.).

12. As per claim 6:

Crozier and Pechanek disclosed the method of claim 5 wherein a selecting operation is performed when a current count in a processing element is non-positive (Crozier: Figure 2 elements 37 and 48, column 3 lines 24-31 and column 4 lines 12-22)(It would have been obvious to one of ordinary skill in the art at the time of the invention that the counters could have been initially set and decremented until the data arrived in the correct place to perform the 90-degree rotation as shown in figures 5b-d. Additionally, it would have been obvious to one of ordinary skill in the art that upon reaching zero, the data values would be stored so that the next shifting could occur with the data in the correct places.).

13. As per claim 36:

Claim 36 essentially recites the same limitations of claim 1. Therefore, claim 36 is rejected for the same reasons as claim 1.

14. Claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over Crozier (U.S. 5,081,700), in view of Pechanek et al. (U.S. 6,338,129), further in view of Taylor (U.S. 4,992,933).

15. As per claim 7:

Crozier and Pechanek disclosed the method of claim 1.

Crozier and Pechanek failed to teach selecting which processing elements are active in response to a row select signal and a column select signal.

However, Taylor disclosed selecting which processing elements are active in response to a row select signal and a column select signal (Taylor: Figure 1, column 4 lines 7-29).

The row and column select signals allow the array processor to locally modify global shift instructions (Taylor: Column 2 lines 42-54). The advantage of increased flexibility in shifting operations would have motivated one of ordinary skill in the art to implement row and column select signals. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement row and column select signals for the advantage of increased flexibility in global shift operations.

***Response to Arguments***



16. The arguments presented by Applicant in the response, received on 8/11/2010 are partially considered persuasive.

17. Applicant argues "In rejecting independent claims 1, 8, 22, and 36, the Office argues that FIG. 5 of Crozier discloses a plurality of shift operations between figures 5b-d amongst the individual rows and columns being shifted different amounts, where each figure shows a single shifting operation that is shifted in such a way that each location receives every data held in every position of the row/column. While the applicant does not concede the correctness of the Office's position, in the interest of expediting prosecution, independent claims 1, 8, 22, and 36 have been amended to recite a plurality of shifting operations by a plurality of rows or columns that result in each processing element in each row or column receiving data held in every other processing element in that row or column. This amendment is as suggested by the Office at page 16 of the Final Office Action and is supported throughout the application at issue including at paragraphs [0049]-[0065] and FIGS. 6A, 6B through 14A and 14B."

The examiner partially agrees for the following reasons. The combination uses the processing array of Pechanek to store the array data between shifting operations. Claims 1 and 36 are amended to recite that the plurality of shifting operations are performed on a plurality of rows or columns of the processing elements. The combination teaches this because a single row or column reads upon the claimed shifting operation for each shifting direction. The three shifting directions allows for a plurality (i.e. three) shifts in a plurality of rows or columns in the processing array. Claims 8 and 22 are amended to recite that each shifting direction has a plurality of

rows or columns that are shifted. As Crozier only disclosed a single shift among a shifting direction, the amendment overcomes the rejection of Crozier. An updated prior art search has been performed that hasn't found any additional prior art that reads upon these claims. Thus, claims 8-15 and 22-29 are considered allowable.

### ***Conclusion***

The following is text cited from 37 CFR 1.111(c): In amending in reply to a rejection of claims in an application or patent under reexamination, the applicant or patent owner must clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. The applicant or patent owner must also show how the amendments avoid such references or objections.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JACOB PETRANEK whose telephone number is (571)272-5988. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jacob Petranek/  
Examiner, Art Unit 2183